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**SUMMARY HISTORY: AIR FORCE  
MISSILE AND SPACE DEVELOPMENT FACILITIES  
LOS ANGELES, CALIFORNIA**

**1954 - 1964**



SUMMARY HISTORY  
AIR FORCE MISSILE AND SPACE DEVELOPMENT FACILITIES  
LOS ANGELES, CALIFORNIA - 1954-1964

prepared by  
Space Systems Division Historical Office  
January 1965

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## FOREWORD

This paper was prepared by the Space Systems Division historical office in answer to one of many requests for historical information about the chain of events leading to the establishment of Los Angeles Air Force Station. Although this summary account does not represent a comprehensive history of these activities, it is fully documented and complete within the strictures of the summary format. The paper has proved to be quite useful as an internal reference source and publication in this form has been chosen to make it available for use on a wider scale.

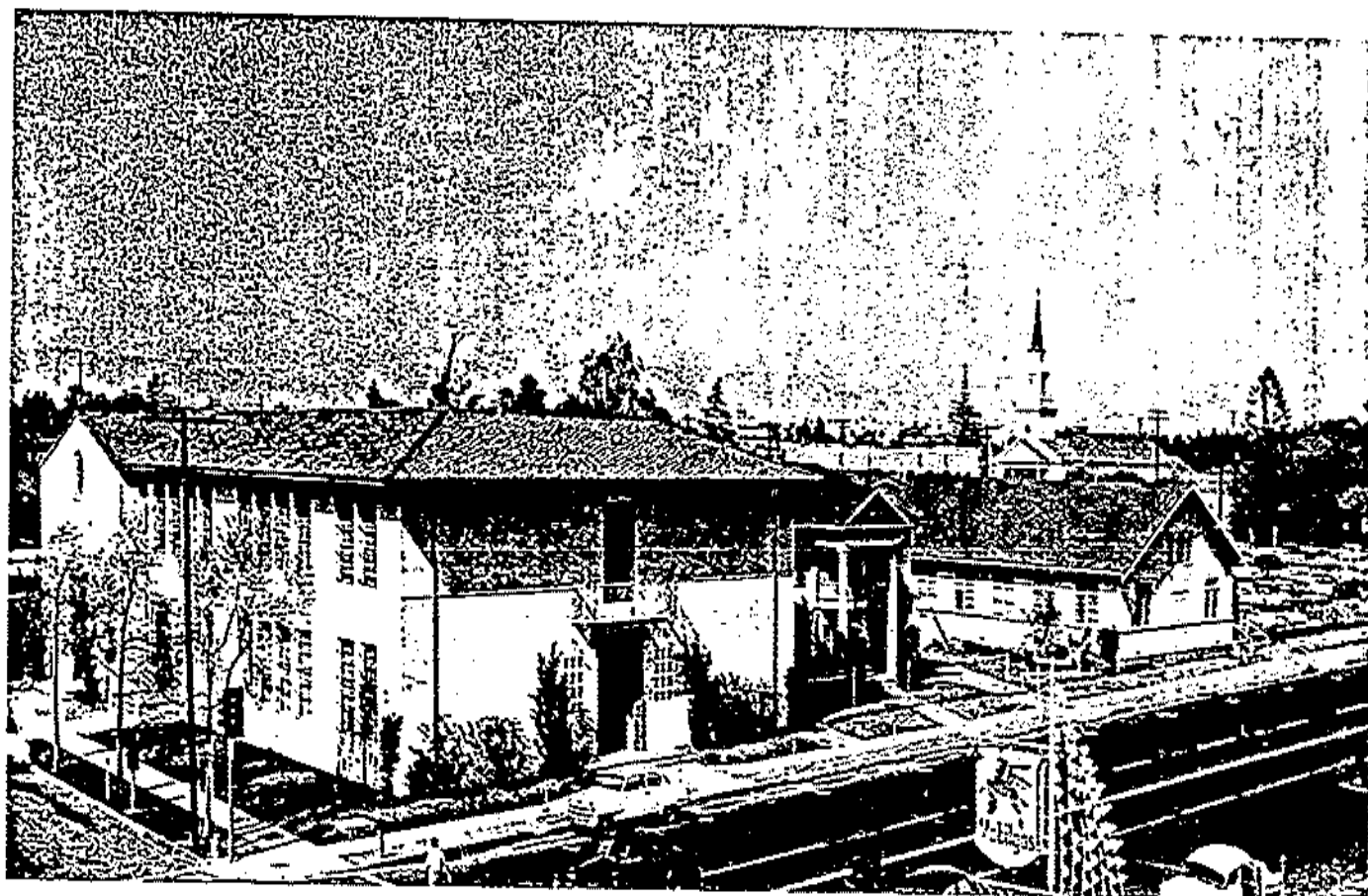
All documents cited in the footnotes are located in the archives of the Historical Division, Office of Information, Space Systems Division, Air Force Systems Command, at Los Angeles Air Force Station.

WDP  
January 1965

When Western Development Division was organized in July 1954 to accelerate the ballistic missile program, a handful of officers and civilians worked in temporary offices in a former parochial school building in the heart of downtown Inglewood, California. Ramo-Wooldridge Corporation technical specialists and the Air Materiel Command's Special Project Office shared the same offices with Western Development Division's project officers. This physical proximity was required by the unconventional nature of the management techniques to be utilized. The Air Force itself, in accordance with the advice of the von Neumann Committee, had assumed responsibility for system integration traditionally delegated to the prime contractor. To assure valid systems engineering and technical direction of associate contractor effort in the extremely complex program, the Air Force employed the scientific and engineering capability of the Ramo-Wooldridge Corporation. Air Force officers, civil service employees, procurement specialists and contractor engineers sat side-by-side--or in adjacent offices--to direct the nation's most important weapons development effort. "Collocation" was essential to this massive technical undertaking.

As the scope of the program expanded and the organization grew, the limited quarters became extremely crowded. The Ramo-Wooldridge Corporation, acting in accordance with its contract to furnish materials and service support as well as systems engineering and technical direction, acquired larger and more efficient facilities. Thus, early in 1955 the first of two buildings under construction on Arbor Vitae Street, a few blocks west of Inglewood's city limits, was completed and occupied.

Buildings Three and Four, constructed in close sequence to One and Two (see accompanying map), were first leased by the Air Force but the high cost of leasing led to government purchase in the summer of 1955. Later that year, the Ramo-Wooldridge Corporation purchased approximately 40 acres on the southeast corner of El Segundo and Aviation Boulevards. Although this location was about three miles south of the Arbor Vitae Street offices, it was the closest practicable site available. Beginning in mid-1956,



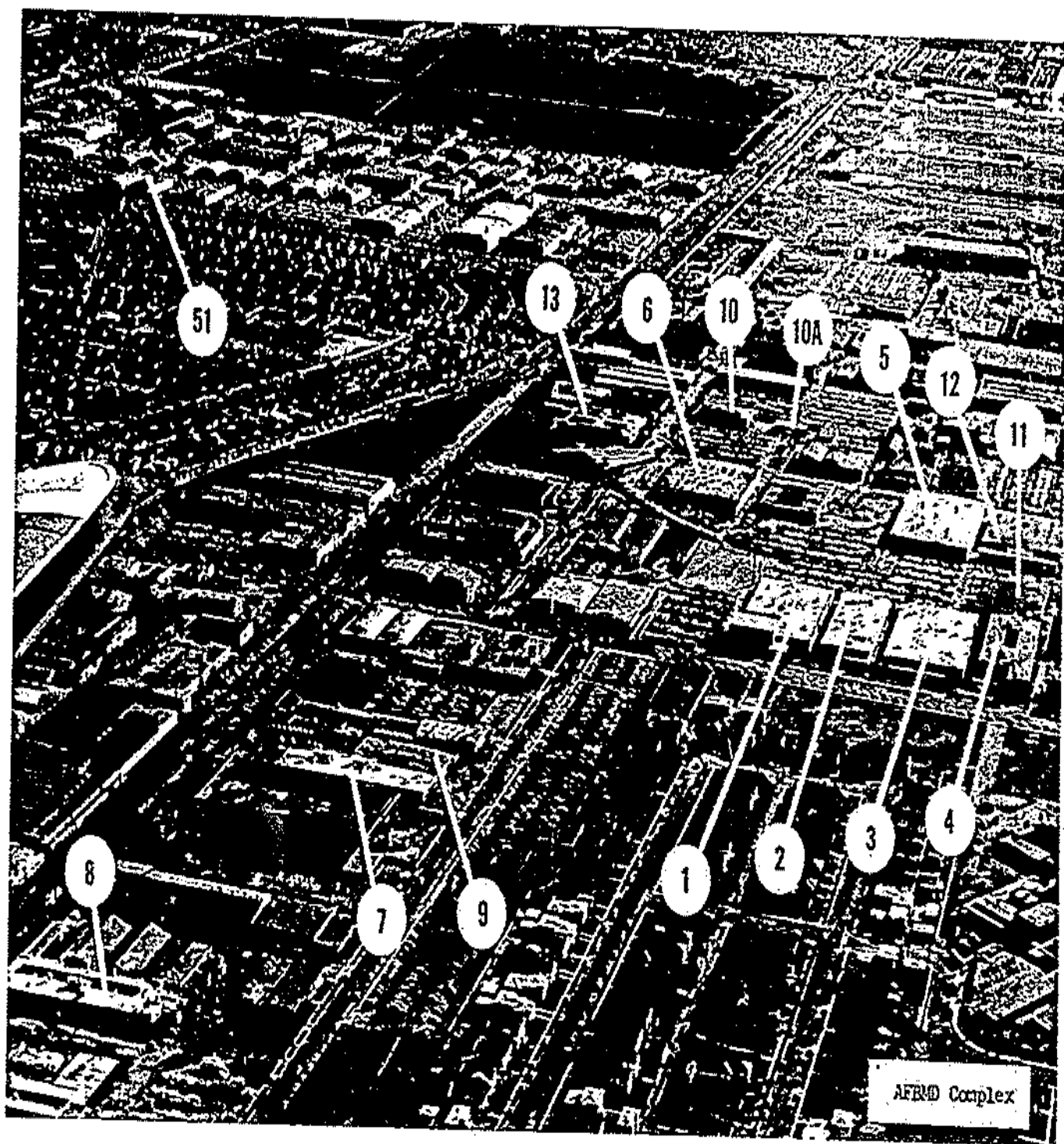
First Western Development Division Offices  
Formerly St. John's School, Inglewood, California

the facility called the Research and Development Center was constructed there.

The decision to build additional facilities in El Segundo implied no weakening in the policy of collocation of critical management elements. It was, rather, a response to a rapidly increasing demand for more office and laboratory space. Increasing numbers of military and civilian management and contracting personnel, a parallel increase in systems engineering and technical direction manpower, and expanding liaison offices located within the complex--through 1957 this was the Arbor Vitae location--taxed existing facilities to their limits. As mission assignments increased in number and ballistic missile development moved into operational planning and early site activation activity, additional buildings were leased in the Arbor Vitae area.

During 1957, Buildings One through Eight in the Arbor Vitae complex were occupied by the various Air Force organizational elements, the Ramo-Wooldridge Corporation, and its Guided Missile Research Division (renamed Space Technology Laboratories during 1957). Western Development Division (renamed Air Force Ballistic Missile Division on 1 June 1957) had headquarters offices in Building Three, while the materiel command's Ballistic Missiles Office made its headquarters in Building Four. Buildings Six and Eight were completely occupied by Ramo-Wooldridge personnel who also made up the major population of Buildings One and Two.

The Air Force Ballistic Missile Division's Deputy Commander for Weapon Systems, responsible for the missile system program offices, had major offices spread throughout Buildings Four and Five with the supporting engineering and procurement contingents located in adjacent offices. The Deputy Commander for Resources occupied Building Seven and the offices of the Deputy Commander for Operations were divided between Buildings Two and Four. Building Five was also utilized by Ramo-Wooldridge technical people and the Air Force guidance specialists. Through 1957 the division's installations group, growing rapidly as preparations advanced for missile site selection and construction, utilized Building Seven until Building Nine was acquired in December.



Arbor Vitae Complex - February 1962



Other essential services and their offices were scattered about the complex and there was a fairly constant movement of people and office locations as new programs were assigned and the necessary new people added to the population.

The national shock induced by the Russian Sputniks in late 1957 accelerated the pace of change. In January 1958 the Air Force Ballistic Missile Division was relieved of operational planning for ballistic missiles and responsibility for initial operational capability with the missiles in the field. These tasks were assigned to the Strategic Air Command and the division Deputy Commander for Operations, with his entire staff, was integrated with the Strategic Air Command liaison office to form a new organization designated SAC/MIKE. Fortunately, construction of the new "R&D Center" was far enough advanced to permit Space Technology Laboratories to move its staff from Building Eight to the new El Segundo offices and SAC/MIKE established its headquarters in the vacated building.

The R&D Center was completed in the Fall of 1958 and, although the movement of some Space Technology Laboratories technical people to their new offices temporarily relieved the extreme congestion in the Arbor Vitae complex, it placed a strain on the principle of collocation. The problem was solved by some Air Force offices moving into the R&D Center while, at the same time, special care was taken to assure that system program offices retained their BMD/STL/BMO/SAC/MIKE integrated management organization.

During 1958 Building 11 was built by the Air Force to house medical and dental services and a cafeteria, and Building 12 was leased to accommodate the comptroller, technical library and Space Technology Laboratories technical people. In 1959, Building Ten was leased as a warehouse and the installations work of the division had increased so that it was necessary to lease Building 13--the last acquired in the immediate Arbor Vitae vicinity.

Thus, thirteen buildings (ten leased and three government owned) were acquired during the period of temporary solutions. The urgency

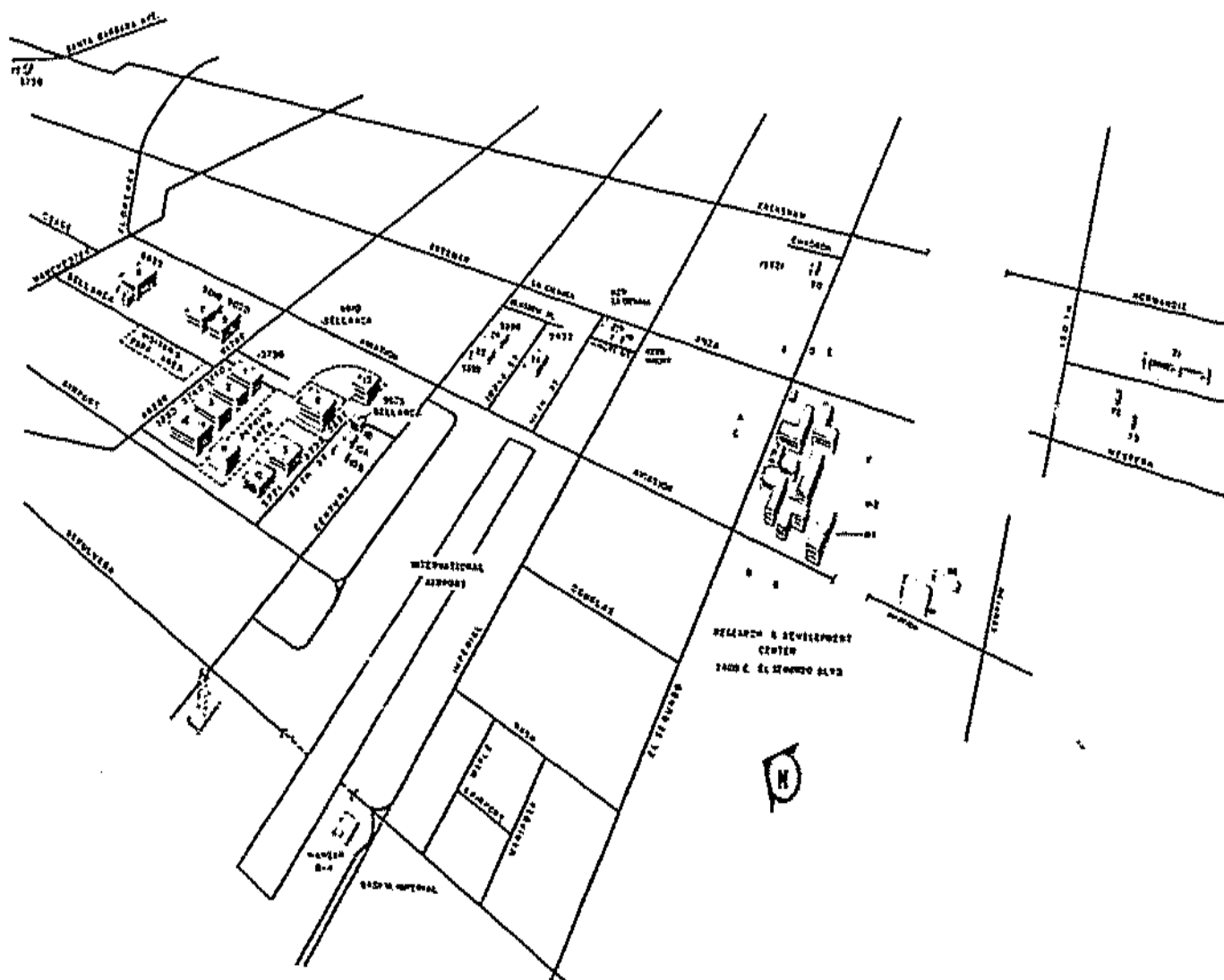
## AF Ballistic Missile Program



of the mission assignment demanded office and laboratory space. It was difficult, however, to visualize a long term solution to the housing problem due to uncertainty as to the scope or duration of the ballistic missile and space missions. Meanwhile costs and inefficiencies associated with scattered facilities mounted. The yearly leased facilities budget reached nearly \$800,000 in 1960 and was scheduled to exceed \$1,000,000. Of necessity the principle of collocation was now frequently breached. Although the highest priority programs were managed by tightly integrated cadres of responsible project officers, engineering specialists, and procurement experts, the normal day-to-day business was subjected to greater stress. Communication between offices and people was hampered by an increasing number of impediments, an intra division bus system operated between the far flung offices, special communications lines were necessary, and an augmented guard force was necessary to maintain security, all adding to increased costs and accumulated delays.<sup>1</sup>

The facilities difficulty may be emphasized in another way by noting manpower totals illustrated in the accompanying charts. Rapid growth in the number of people engaged in the ballistic missile development enterprise was not matched by a corresponding expansion of facilities. On 1 January 1959 ballistic missile division personnel at work totaled 1,213; the materiel command's contracting and logistic planning force numbered 378; and there were 145 people in the planning office of the strategic command for a total of 1,736 Air Force personnel. In addition, 3,080 Space Technology Laboratories engineering and support personnel were housed in the various offices.<sup>2</sup>

In the spring of 1959, realizing that long term planning offered the only hope for a permanent solution, the commander appointed a committee to investigate the division's facility requirements. The committee conducted a thorough review of the problem but, due to some temporarily unsettling mission assignments, had to leave its work unfinished. A fresh start was made in the fall of 1959 with the appointment of a full time Long Range Facility Committee to study and recommend a future permanent location for the ballistic and space development division on the assumption



Area Map - February 1962

MANPOWER SUMMARY  
AIR FORCE BALLISTIC MISSILE DIVISION 1954-1961

		1954		1955		1956		1957		1958		1959		1960		1961	
		May	Nov	Jan	Jul	Jan	Jul	Jan	Jul	Jan	Jul	Jan	Jul	Jan	Jul	Jan	Mar
<b>AFBMD*</b>																	
Military																	
Authorized		27	40	70	189	212	319	428	545	619	806	876	1082	1259	1485	1485	
On Board		28	32	51	75	207	305	364	393	520	833	898	915	1143	1209	1303	
Civilians																	
Authorized		25	41	85	156	171	224	224	300	408	437	436	524	588	739	736	
On Board		24	26	55	102	169	197	202	208	317	380	412	474	588	640	693	
<b>BMC</b>																	
Military																	
Authorized		3	3	4	41	29	47	54	55	118	142	162	162	204	254	193	
On Board		3	3	4	7	30	37	45	55	100	110	127	152	183	220	223	
Civilians																	
Authorized		12	15	36	97	96	102	124	203	274	331	419	452	533	146	132	
On Board		5	11	18	43	60	89	112	147	236	268	342	437	521	135	129	
<b>SAC MIKE</b>																	
Military																	
Authorized												158	163	97	52	32	14
On Board												85	131	102	66	32	15
Civilians																	
Authorized												35	60	48	30	16	5
On Board												31	46	43	28	16	5
<b>TOTAL AUTHORIZED</b>		67	99	195	483	508	692	830	1296	1642	1861	1975	2268	2603	2624	2546	
<b>TOTAL ON BOARD</b>		60	72	128	227	466	628	723	919	1350	1736	1873	2026	2455	2204	2348	
<b>GMRD (STL)</b>																	
On Board		15	132	194	410	625	1209	1604	1939	1976	2099	3080	3877	4685	5182	4330	4394
<b>Aerospace</b>																	
On Board														Aug		236	1883 2189

\* Hq AFBMD and 6592d Support Group

## Manning Summary -- 1961

## DEPUTY COMMANDER FOR AEROSPACE SYSTEMS

Organization	OFFICERS			AIRMEN			CIVILIANS			TOTAL		
	Authorized		On Duty	Authorized		On Duty	Authorized		On Duty	Authorized		On Duty
	1 Apr	31 Dec	31 Dec	1 Apr	31 Dec	31 Dec	1 Apr	31 Dec	31 Dec	1 Apr	31 Dec	31 Dec
DCAS Staff	29	28	29	-	-	-	5	5	4	34	33	33
6592d Support Wg	160	155	150	239	221	222	318	314	329	717	690	701
Hq Space Sys Div	559	555	546	5	4	4	419	411	395	983	970	945
6594th Aerospace Test Wing (Sunnyvale, Calif)	275	282	295	1037	1055	926	80	90	79	1392	1417	1300
6593d Test Group (Edwards AFB)	113	120	117	217	221	183	420	522	507	750	863	807
6595th Aerospace Test Wing (Vandenberg AFB)	120	125	169	255	294	376	31	31	29	406	450	574
SSD Totals	1067	1082	1127	1514	1574	1489	950	1044	1010	3531	3700	3626
Hq Ballistic Sys Div (in Los Angeles)	402	410	428	14	15	19	538	536	528	954	961	975
BSD Operating Locations (Norton AFB & SATAFs)	486	471	462	169	193	174	371	371	336	1026	1035	972
6555th Aerospace Test Wing (Patrick AFB)	100	100	96	423	423	396	71	71	67	594	594	559
BSD Totals	988	981	986	606	631	589	980	978	931	2574	2590	2506
DCAS TOTALS	2244	2246	2292	2359	2426	2300	2253	2341	2274	6856	7013	6866

that an Air Force development organization would remain on the West Coast. Several locations were studied, recommended, and eventually rejected--a process that occasionally reached the Air Force secretariat level. Sites that were promising but unacceptable for one reason or another included Los Alamitos Naval Air Station (since the Air Force was planning to close down a number of active bases it seemed very unlikely that approval could be obtained to acquire a new base), located a few miles east of Long Beach, California; Navy owned property and buildings located on the northwest corner of El Segundo and Aviation Boulevards; and 80 acres of vacant land located near the southwest corner of the same intersection. On 26 August 1960, while search and study continued, the Air Force Ballistic Missile and Space Committee reviewed the Los Angeles facilities problem and suggested that the division consider Norton Air Force Base at San Bernardino, California, and March Air Force Base at Riverside, California (both about 70 miles east of Los Angeles) as possible permanent home sites. The local committee concluded that in each instance base facilities were unsuitable to house all the ballistic missile and space program management offices.

But the necessity to do something about obtaining additional quarters was approaching a crisis. On 9 July 1960, the Air Force had responded to acute missile site activation problems by assigning the responsibility for all site activation work to the materiel command. After July 1960 the ballistic missile division retained executive management responsibility for development of the systems while the materiel command's Ballistic Missiles Center, sharing the same total office space with the division, was responsible for site activation. The most significant impact of this change on the facilities problem was the addition of about 800 more workers to the missile development complex, which by now was barely able to contain the 7,600 people already there.<sup>3</sup>

Moreover, the new responsibility for the Ballistic Missiles Center of the materiel command created for the first time "... two management missions of highest national urgency within the complex, which though related involve separate organizations which are competing for management

attention and resources. " The inevitable result was "serious organization tensions. . . aggravated by the lack of physical space to accommodate the rapid buildup of personnel for the overall site activation task. "<sup>4</sup>

In anticipation of this difficulty the Air Force vice chief of staff had directed the materiel and research commands to thresh out the problem and come up with a plan to relocate those elements of the complex that did not require close coordination with Space Technology Laboratories. A plan of action was to be worked out by 26 September 1960, a deadline that allowed little time to solve a problem which had defied solution for nearly two years. Under the circumstances the choice of Norton AFB as an alternate location gained increasing support. In early September, Brigadier General W. E. Leonhard, the missile division's deputy commander for facilities, presented to members of the air staff a plan for moving certain elements of the ballistic division and procurement functions to the San Bernardino base.<sup>5</sup>

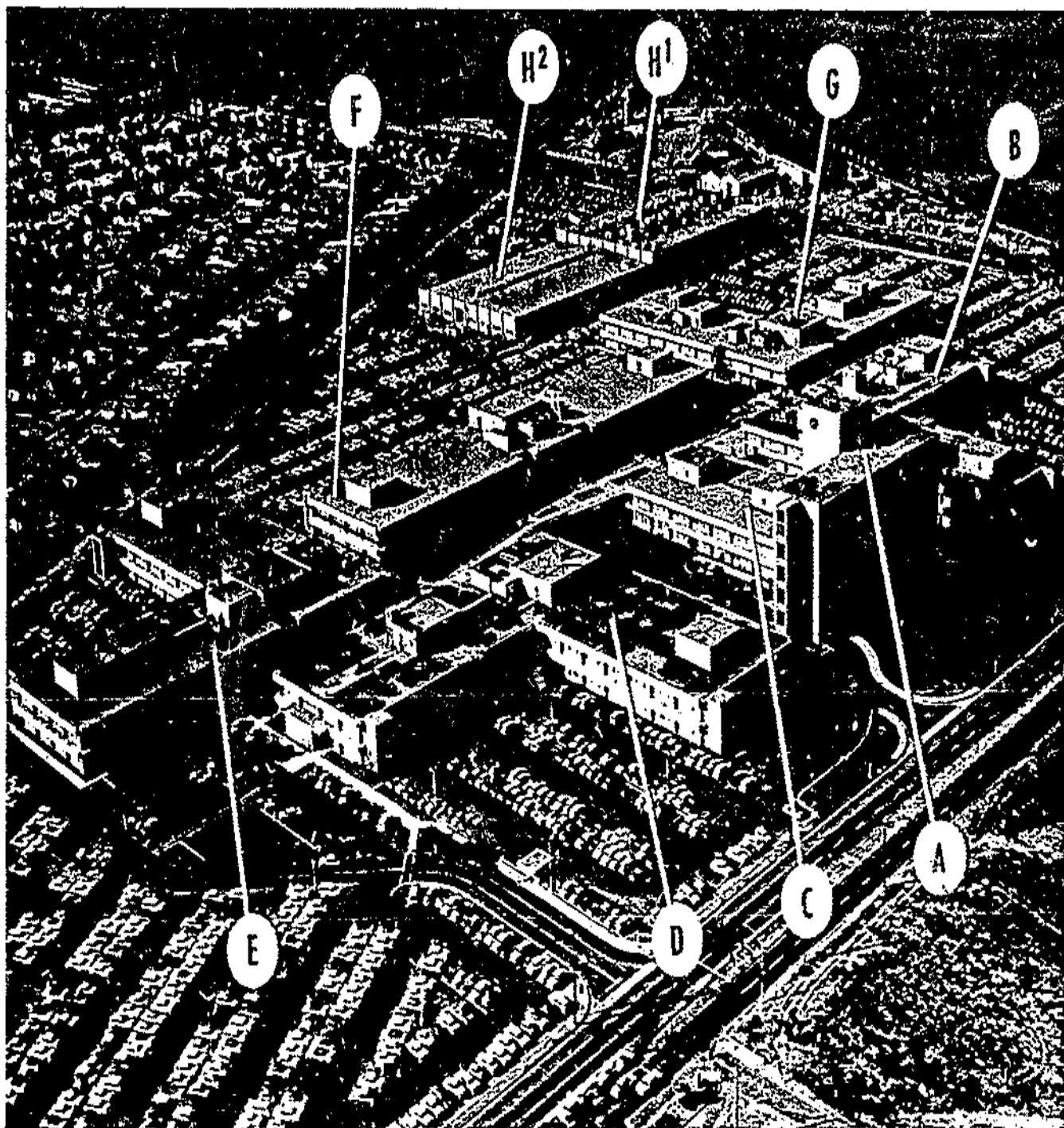
As more thought was given to the relocation problem, the advantages of the proposed move to Norton Air Force Base became increasingly attractive. General Schriever, in a letter to the Air Force chief of staff on 23 September 1960, clearly stated that such a separation offered the opportunity to restore ". . . the singleness of purpose and cohesiveness of management. . . mandatory for the aggressive translation of technology into space capabilities of importance to national security. . . ." Schriever endorsed the proposal that contemporary ballistic missile programs be moved from the Inglewood complex to San Bernardino "as rapidly as possible. " Furthermore, said Schriever, program management responsibility should be assigned to the materiel command as the programs were transferred.<sup>6</sup>

Action was not long in coming. On 29 September the Air Force vice chief of staff ordered the site activation management task ". . . immediately relocated to San Bernardino where the current ballistic missile program can be accommodated on a phased basis, " adding that the Inglewood complex would ultimately ". . . become the permanent focal point and be strongly identified as the USAF military space development agency. "<sup>7</sup>



Meanwhile, significant alteration had been made in the role of Space Technology Laboratories. Because of its unique contractual relationship with the Air Force, the laboratories and the parent organization (Ramo-Wooldridge Corporation) were denied ballistic and space hardware development contracts. This exclusion, in addition to certain other aspects of its relationship with the Air Force and industry, created a climate of public interest in--and criticism of--the unique relationship between STL and the Air Force. Congressional committees recommended--and the Air Force planned--replacement of the laboratories with a non-profit corporation to perform systems engineering and technical direction of Air Force advanced missile and space programs. After study in 1959, the proposal advanced in 1960 through the approval channels of the Air Force, the Department of Defense, and Congressional hearings to the point of acceptance. Protracted negotiations, necessary to unravel the complex legalities and interests involved without disrupting the critical missile and space programs, were concluded in time to permit establishment of the new non-profit, California chartered, corporation by mid-June 1960.

In sponsoring the organization the Air Force agreed to provide an advance payment pool and adequate facilities. The new Aerospace Corporation was immediately assigned office space in the R&D Center buildings and, based on a detailed cooperative agreement, it acquired 300 technical employees from STL to furnish its initial manning. The agreement also included purchase by the Air Force of the R&D Center--nine buildings on 39.5 improved acres, paved parking areas, and associated facilities--at a price to be negotiated. Administration of all the many leased buildings used by the Air Force passed to the Aerospace Corporation. The new corporation also assumed the support functions previously performed by STL, systems engineering and technical direction for space programs and new missile programs (responsibility for Atlas, Titan, and Minuteman remained with STL), and research and study programs already in progress.<sup>8</sup>

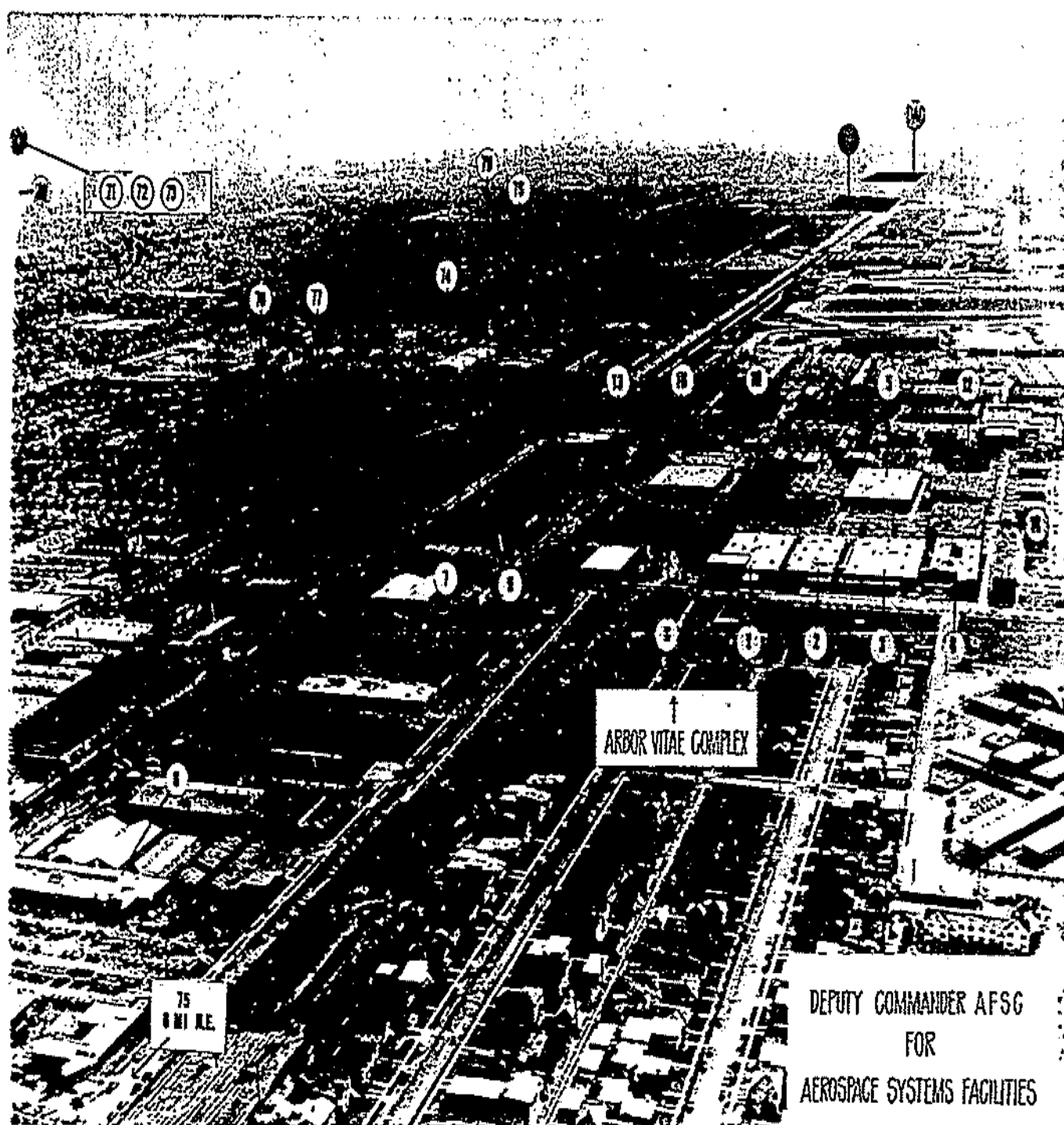


Research and Development Center

Air Force acquisition of title to the R&D Center was a more prolonged effort. Agreement was reached on a price of \$23,500,000 and Aerospace Corporation leased the R&D Center from STL for a negotiated sum of \$185,800 per month until title finally passed to the Air Force (December 1960). In return, STL was furnished space at the R&D Center for its people who were still working on Air Force programs while moving quickly to vacate several R&D Center buildings, lease other office space and begin planning construction of a new center.<sup>9</sup>

It was the hope--soon patently clear a hope that was not to be realized--that all of the development management effort could be housed at the R&D Center or at the Arbor Vitae location. As early as the fall of 1960 the pressure for additional room was building up. Although the plan to move some elements to Norton Air Force Base had been approved, the base was not yet prepared to accept significant numbers of people and the problem of their support was not fully resolved. Immediate solutions were necessary and in the fall of 1960 additional buildings were leased, a maximum of 12 additional buildings by mid-1961. In addition 90 large trailers were rented and parked at the two complexes to furnish additional office space. By this time, buildings were scattered throughout a 56 square mile area in Inglewood, Hawthorne, Lawndale, Torrance, and southwest Los Angeles. Inefficient use of technical personnel and degraded supervision of development programs resulted and, except for the highest priority programs, the principle of collocation could no longer be practiced.

At the beginning of 1961 the solution of facilities problems had reached a plateau for the moment through temporary expedients combined with plans for moving elements of the missile development complex to Norton AFB. There remained, however, complex considerations which delayed any significant movement to Norton Air Force Base for another year and a half. Development management activity and procurement actions had been carried on in close proximity in Los Angeles, utilizing accelerated decision making procedures designed to shorten acquisition time. Movement of contractual and procurement functions to San Bernardino



Area Photograph - February 1962

was reviewed with increasing alarm not only by the space system program offices but by missile system managers who were not yet ready to transfer management to the materiel command.

Further complications were introduced with the January 1961 change of national administration. On 28 January 1961 newly appointed Secretary of the Air Force E. M. Zuckert called a Pentagon conference of key civilian and military leaders in the Air Force. Already informed about major problem areas confronting any new definition of Air Force policies, Zuckert wanted to give Secretary of Defense R. S. McNamara a realistic appraisal of the Air Force's capability to meet new demands on its resources. During the review process, one of the critical issues was the necessity of, and means for, insuring continued emphasis on attaining full operational capability with the ballistic missile force in the shortest possible time.<sup>10</sup>

On 6 March 1961, the Secretary of Defense resolved a long standing ambiguity by assigning to the Air Force responsibility for development of all new military space systems. Assumption of this mission was accompanied by a major Air Force functional realignment. On 17 March 1961, public announcement was made of sweeping changes ". . . designed to centralize direction of the ballistic missile programs and to insure the most effective discharge of those military space responsibilities assigned to the Air Force."<sup>11</sup>

The former Air Research and Development Command was placed in control of the entire weapon system acquisition process with the new name of Air Force Systems Command and the additional functions of procurement and production picked up from the old Air Materiel Command. In the place of the materiel command, an Air Force Logistics Command was created to furnish, as its name suggested, logistic support to the Air Force. Within the systems command new divisions were organized, with perhaps the greatest impact of the command reorganization felt at the missile development complex in Los Angeles. The Air Force Ballistic Missile Division and Ballistic Missiles Center were discontinued and out of the resources were created two new organizations, Space Systems Division and Ballistic Systems Division. To insure utmost response and close control in these

two prime areas of interest, a Deputy Commander for Aerospace Systems was established in Los Angeles to act for the Commander, Air Force Systems Command.<sup>12</sup>

While the reorganization was going on, the projected move to Norton Air Force Base at San Bernardino was not forgotten. On 1 May 1961, the Secretary of the Air Force ruled: "After careful consideration, it has been determined that the entire Ballistic Missile [Sic] Systems Division should move to Norton Air Force Base on a planned phase basis beginning at the earliest practicable date." (Some elements of the Atlas and Titan program offices had already relocated to the base in accordance with existing plans.) Further moves were delayed pending the availability of base facilities capable of accommodating approximately 2,000 more employees. A plan to remodel an existing warehouse for office space and to provide Aerospace Corporation support at the new location delayed the move of the Ballistic Systems Division until June and July of 1962.<sup>13</sup>

Thus over a year passed before the basic objectives involved in establishing a single space agency were totally realized. The close association of the two divisions in Los Angeles directly under the Deputy Commander for Aerospace Systems was generally considered to be a transitional pattern of organization. By May 1962, a plan was effected to furnish the two divisions with normal support functions and staff services (such as information, comptroller and personnel) earlier allocated to the 6592d Support Wing and by 1 June each division was autonomous with one prepared to relocate at Norton Air Force Base and the other to remain at its Los Angeles location.<sup>14</sup>

When the two divisions were established on 1 April 1961, headquarters of the Space Systems Division was located at the R&D Center and, until the move to Norton Air Force Base, the Ballistic Systems Division remained at Arbor Vitae with the deputy commander offices. When the move to Norton was completed, most of the Space Systems Division headquarters staff moved to Arbor Vitae (Building One) and Aerospace Corporation was able to consolidate the bulk of its offices at the R&D Center. Even with this

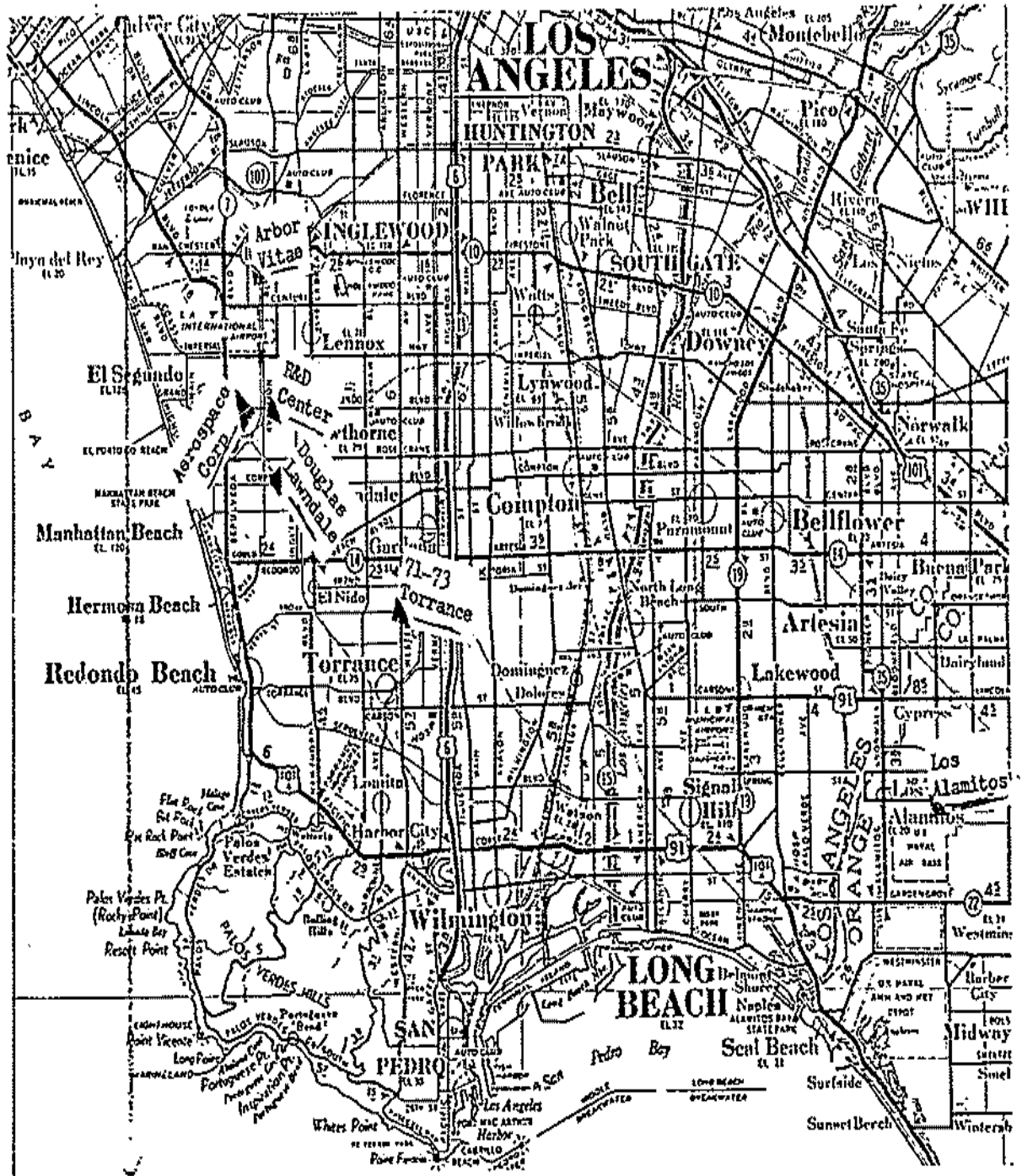
significant improvement in available office space, the principle of collocation was still difficult to practice and the three mile separation between the Arbor Vitae complex and the R&D Center was inherently inefficient.

Since 1959 the ballistic missile and space organizations had maintained a continuous search for a permanent solution to the housing problem. By December 1960 an initial 672 government owned facilities within eleven western states had been screened as possible sites. Most were found wanting in many essentials--availability of technical manpower being critical--and none were adequate without additional high cost construction of new offices and laboratories. As the problem was continuously reviewed, the obvious conclusion seemed to be that the best location for the Air Force's ballistic missile and space development effort was in the Los Angeles area near the R&D Center. The area's advantages: the favorable labor market, the center of scientific and technical talent, and availability of transportation and communications could not be lightly ignored.

In any case, by January 1961, the ballistic missile division had reduced a host of possible choices to the following recommended alternatives:

- (1) Acquire Douglas Aircraft Company property in Lawndale, located a mile and one-third directly south of the R&D Center. The property included two buildings, 80 and 81, on 40 acres of land which Douglas offered in trade for part payment on Air Force Plant 15 at Long Beach, California;
- (2) negotiate a 10 to 20 year lease for the McDonald Building (between Buildings Five and Six in the Arbor Vitae Complex) on 96th Street with option to buy as soon as funds were available;
- (3) build a new Building 14 on land adjacent to the McDonald Company;
- (4) build one or two buildings on the Bellanca Avenue parking lot (Arbor Vitae area);
- (5) attempt to acquire other buildings as required to meet anticipated increases in the space division's manpower.

The most desirable of these limited alternatives--in terms of Air Force ownership as opposed to continued leasing of widely separated buildings--was to request official approval for acquisition of the Douglas Lawndale property. A one year lease was negotiated with Douglas, effective 20 February 1961, to use Buildings 80 and 81 until they could be



Los Angeles - Long Beach Area Map



acquired by the government. Plans were made to move some 500 Space Systems Division personnel from the Arbor Vitae complex to temporary quarters in Building 81. This was to be their office home for approximately five months, after which they would move into the R&D Center with Aerospace Corporation and other Air Force personnel while Building 81 was modified. The rehabilitated building, modified to accommodate some 1,500 employees, would ultimately become the headquarters for Space Systems Division with Aerospace Corporation headquartered in the R&D Center.<sup>15</sup>

These plans were contingent on obtaining approval for the required modification of the buildings being acquired from Douglas. Although design of the modifications was completed in April and the cognizant congressional committee had approved Air Force acquisition of the property, innumerable reviews, re-evaluations, and re-submissions delayed final approval until late in 1961. At year's end, designs were virtually complete but the funds had not yet been released. Modification of Buildings 80 and 81 was still intertwined with the question of a permanent location for segments of the deputy commander's office, scheduled to remain in Los Angeles. One of the alternatives presented to the Secretary of the Air Force in May 1961 had been the construction of three--later reduced to two--more office buildings on the Douglas Lawndale site to form a permanent complex which would house 4,000 to 4,500 personnel. A proposal for this construction was drawn up and submitted to command headquarters in July and, although approved at that level, the recommendation was rejected by Air Force headquarters reviewing authority.<sup>16</sup>

For the first five months of 1962 the division's long range housing plans were temporarily laid aside while detailed planning for the Ballistic Systems Division move to Norton Air Force Base was undertaken. A new start was made in May 1962 when the division resubmitted a fiscal 1964 military construction program for the Lawndale site. The cost for modification was estimated to be \$3,200,000 and \$12,000,000 was requested for two multi-story office buildings.<sup>17</sup>

In June 1962, a way was opened for further consolidation of division facilities in the vicinity of the government-owned R&D Center. The Department of the Navy granted the Air Force permission to use four buildings at the Douglas El Segundo site, directly across the street. The permit was issued as an interim measure anticipating transfer of the entire requested 50 acres of land and buildings to the Air Force.<sup>18</sup>

As matters stood in October 1962, a relief from housing problems appeared imminent. Trailers were no longer necessary at Arbor Vitae, leases on Building 72 (a building in Torrance which was returned to the Navy), 70, 75, 77, 78 and 79 were cancelled. The Lawndale site was to be modified by March 1963, making space for 1,500 people in Buildings 80 and 81 in addition to the 3,500 already located in the R&D Center. Construction of new buildings at the Lawndale site would expand office capacity by another 2,500 people by July 1965. This would then permit release of all leased space, finally placing all elements of the division and Aerospace Corporation in the Navy El Segundo site, the R&D Center or the Lawndale site.<sup>19</sup>

This plan of action left two major problems unsolved. Collocation of Air Force program managers with Aerospace Corporation supporting elements--the management principle upon which the working relationship was predicated--could not be totally effected; and, although the total solution was less costly and more integrated than existing arrangements, anticipated growth would require not only the \$3,200,000 for remodeling but an additional \$12,000,000 for new construction.

Aerospace Corporation was especially interested in a solution to the housing problem which would permit the two elements to maintain their respective identities and yet occupy contiguous quarters. A portion of the large land area just west of the R&D Center which had invited earlier Air Force inquiry regarding availability from its owner, Standard Oil Company, was now available for purchase. This unexpected circumstance produced another very attractive alternative and re-opened the question of a permanent Space Systems Division location. Thus, by mid-September 1962,

four alternate plans confronted deputy commander Lieutenant General H. M. Estes, Jr. The first of these plans suggested the possibility of acquiring the unimproved acreage immediately west of the R&D Center--across Aviation Boulevard--for a building site; the second proposed construction of new buildings on the Douglas El Segundo property to augment Buildings 80 and 81 at the Lawndale site; the third advocated carrying out the Lawndale site construction program and occupancy as planned; and the fourth suggested use of the R&D Center, Buildings 80 and 81, and the Arbor Vitae complex. The first three plans would permit release of all buildings in the Arbor Vitae area with the exception of government owned Buildings Three, Four and 11.<sup>20</sup> On 21 September, General Estes and Dr. Ivan A. Getting, President of Aerospace Corporation, appointed a joint Air Force-Aerospace Corporation Facilities Utilization Planning Committee composed of two representatives from each organization. They were assigned the task of recommending the most efficient allocation of space between the R&D Center, the Arbor Vitae complex, and Building 80 until such time as a final decision was made and permanent quarters became available. The main task, however, was to recommend one of four plans for ". . . Air Force/Aerospace Corporation facilities in the Los Angeles area during the next four years." In general these were the same plans or variations of the plans previously prepared for General Estes. The committee was to recommend a plan to the division and Aerospace Corporation by 12 October 1962.<sup>21</sup>

Possibly anticipating the committee's recommendation, Dr. Getting pointed out in early October that certain elements necessary for a final solution of the location problem appeared to be falling into place. The Standard Oil property which was unavailable in the fall of 1960, and the Douglas El Segundo property which the Navy had insisted it needed, were now both available. The Standard Oil property had been sold to the Utah Construction and Mining Company which was willing to sell to the Aerospace Corporation (through a third party) and the Navy was in the process of turning over 50 acres of the Douglas El Segundo property to the Air Force.

In addition, Aerospace was most reluctant to accept the Lawndale location as part of the solution insofar as its own operations were concerned and much preferred that ". . . the Air Force headquarters and other operations associated with our technical activity be close to Aerospace." Therefore Dr. Getting proposed construction of

. . . buildings across Aviation Boulevard on the Utah property. These buildings would be planned to be ready essentially as soon as the Lawndale property could be. The initial building program would provide a headquarters building for Aerospace Corporation and technical buildings of sufficient size to hold the Aerospace SR&P [Systems Research and Planning] and the engineering subdivisions (the non-located part of the Engineering Division).

Furthermore, it was pointed out, the former Navy El Segundo property would furnish service facilities with ample potential for future expansion. All other office and warehouse facilities could be released permitting significantly lower operational costs and the entire Air Force development effort could be consolidated in a closely knit management center.<sup>22</sup>

This increasingly attractive proposal was accepted by the Space Systems Division in the face of obvious problems in obtaining the plan's rapid approval. The plan was approved by Air Force Systems Command officials and immediately forwarded to the air staff and secretariat for their study and, hopefully, approval. Meanwhile, Air Force headquarters requested the division to withhold award of the rehabilitation contract for the two Lawndale buildings until the air staff could study and recommend an appropriate secretarial decision on the total problem. At the same time Space Systems Division and Aerospace Corporation were requested to undertake a joint study to determine comparative costs of the proposed plans, savings in lease termination anticipated by adopting a particular plan, growth potential of each proposal and the proposed use of government owned buildings at Arbor Vitae and Lawndale by the Air Force or other government agencies in the area. It would be necessary to secure ". . . evidence of positive interest from government activities in Los Angeles to occupy buildings 3, 4, 11 at Arbor Vitae and buildings 80 and 81 at Lawndale." Obviously, acceptability of the Aerospace Corporation/Air Force

proposal hinged largely on the demand for the buildings the Air Force now owned and would no longer need if the the Aerospace Corporation building proposal was approved.<sup>23</sup>

An important element favoring prompt approval was the conviction that as the Space Systems Division emerged as an autonomous organization with a vital national mission it was desirable that it be furnished a single facility. In addition, management efficiency would be substantially increased while reduction of support costs in transportation, building leases, and time lost in travel would produce further tangible savings. The proposed plan also offered the considerable advantage of not requiring additional government construction funds. The four new buildings, which the Aerospace Corporation would finance out of earned corporate fees, would eliminate the need for rehabilitation of Buildings 80 and 81 and construction of the new buildings that were planned for the Lawndale site. The three government-owned buildings in the Arbor Vitae complex would be occupied by the Los Angeles Contract Management District at a savings of \$182,000 annually over their current lease arrangements and a prospect existed for sale of the Lawndale property by the General Services Administration.<sup>24</sup>

In early November, approval of the air staff was passed to the Secretary of the Air Force. The secretary had already indicated that he favored the proposal, providing assurance of a plan for disposal of the Lawndale site and the assent of congressional interests could be obtained. Commercial interest in the Lawndale site was strong enough to raise a reasonable expectation of sale at the appraised value of \$3.5 million.<sup>25</sup>

On 8 November 1962, all conditions for approval of the division's plan for permanent facilities having been satisfactorily met, Secretary of the Air Force E. M. Zuckert agreed that Aerospace Corporation should proceed with the building plan. The General Services Administration was instructed to reject all bids for the rehabilitation of Buildings 80 and 81 and prepare for sale of the property. The immediate result of adopting the plan for a permanent location of the division was to require interim

allocation of available office space until such time as Aerospace Corporation could occupy its new buildings. In addition, release of all outlying leased buildings and removal of the last office trailers was to proceed as rapidly as possible. By the last of November Aerospace Corporation's Systems Research and Planning Division moved into the Arbor Vitae area buildings (Three, Four and Five) and Air Force program offices moved into the R&D Center to be collocated with parallel Aerospace program offices. The Aerospace Corporation immediately embarked on the complicated details of land acquisition and preparation of building plans.<sup>26</sup>

The corporation, under a lease-option arrangement, acquired 31 acres of land valued at \$2,406,986 and construction of the four buildings began in February 1963 with the first building ready for occupancy by November 1963. All the buildings (three office-laboratory buildings and a library, total 353,435 square feet) were completed by April 1964 at a total cost of \$12,569,104, including land and site preparation expenses.<sup>27</sup> As rapidly as the new buildings were completed, Aerospace Corporation personnel vacated R&D Center and Arbor Vitae buildings to move into their new quarters. At the same time, Space Systems Division offices at Arbor Vitae were relocated to the R&D Center and support activities began moving into the former Navy El Segundo buildings as they were rehabilitated.

### Summary

The perspective afforded by time makes possible several observations regarding the history of the facilities problem in Los Angeles which might not be obvious at first glance. For instance, a distinct pattern of three phases within the ten years since 1954 emerges. The first five years of operation, principally in leased buildings, was a period during which the overriding urgency of the mission to be performed tended to make all other problems insignificant. Working quarters were obtained by the most rapid and effective means--through leases by the support contractor when purchase was impossible or untimely. A degree of stability appeared

in early 1959 when the 13 buildings of the Arbor Vitae complex plus the R&D Center provided relatively adequate facilities. No permanent solution was yet possible, largely because the future of the Air Force organizations in the complex was not sufficiently clear to encourage a firm commitment to permanent facilities plans.

In the late summer of 1960 another crisis arose when responsibility for the total strategic missile site activation program was consolidated at the Los Angeles complex. The deployment and emplacement of ballistic missiles proved to be a much more difficult task than first imagined, and the urgency even greater. A particular reason for concern was the missile gap of that year; whether real or illusory, it clearly stimulated a significant acceleration in the missile emplacement schedule. Large numbers of additional people were housed in a new lot of leased buildings and office trailers which were accumulated between August 1960 and April 1961. Personnel were widely dispersed over the metropolitan area, but there was no other practicable solution at the time.

Movement of the Ballistic Systems Division out of Los Angeles during the summer of 1962 encouraged planning for a long-term solution. The third phase, beginning with the approval of Aerospace Corporation's building plans in November 1962 and continuing to the present, is characterized by the release of leased buildings and trailers as rapidly as functions can be consolidated on government owned property.

The location and arrangement of facilities for the Air Force missile and space development functions in Los Angeles has largely been determined by the management concepts employed in the highly successful missile and space programs. The original missile development complex was purposefully organized to integrate contractor personnel engaged in systems engineering and technical direction with Air Force people to create the most effective working relationships possible. This principle, called collocation, has been a major contribution to the success of the missile and space development program and a governing factor in consideration of all possible solutions to the long-term facilities problem.

## APPENDIX A

### Key Dates by Building Number

<u>Building</u>	<u>Acquired</u>	<u>Disposition</u>
1	Nov 1956	Subleased - May 1964
2	Jul 1954	Subleased - June 1964
3	Jun 1955	Government owned.
4	Jun 1955	Government owned.
5	Dec 1955	Leased by Aerospace Corp. until Jan 1966
6	Nov 1956	Leased by Aerospace Corp. until Nov 1971
7	Dec 1955	Released - Feb 1964
8	Oct 1953	Converted to Government lease in Oct 1963 (two years)
9	Dec 1957	Leased by Aerospace Corp. until Nov 1964.
10	May 1959	Released - April 1964
11	May 1958	Government owned.
12	Jul 1958	Leased by Aerospace Corp. until Jul 1968
13	Feb 1959	Leased by Aerospace Corp. until Feb 1969
70	Oct 1960	Released - Feb 1962
71	Aug 1960	Released - Jun 1963
72	Aug 1960	Released - Feb 1962
73	Aug 1960	Released - Jun 1963
74	Oct 1960	Released - Jul 1964
75	Oct 1960	Released - Jul 1962
76	Dec 1960	Released - Dec 1962
77	Mar 1961	Released - Sep 1962
78	Apr 1961	Released - Feb 1962
79	Apr 1961	Released - Jan 1962
Office		
Trailers	Mar 1961	Last 53 released - Dec 1962
80 and 81	Feb 1961	Leased until Oct 1961 when acquired by General Services Administration. Used under Air Force Permit to Use until Dec 1962 when Air Force released back to GSA.
Douglas		
El Segundo	Jun 1962	Government owned property, Air Force Permit to Use from Navy from June to Oct 1962 when the property was transferred to the Air Force.



## APPENDIX B

### CHRONOLOGY - Facilities Acquisition Events

- 1954 Jul Leased Building Two
- 1955 Jun Purchased Buildings Three and Four
- Dec Leased Buildings Five and Seven
- 1956 Nov Leased Buildings One and Six
- 1957 Dec Leased Building Nine
- 1958 May Construction completed on Building Eleven, Government owned
- Jul Leased Building Twelve
- 1959 Feb Leased Building Thirteen
- May Leased Building Ten
- 1960 Jan After extensive study--during 1959--of the possible alternatives for a permanent location for the Ballistic Missile Division, the Commander Air Research and Development Command decided that the status and future of Space Technology Laboratories' role in relation to the Air Force would first have to be defined.
- Jun Aerospace Corporation formed as a non-profit company to perform systems engineering, technical direction, and technical support for advanced missile and space programs.
- Jul The ballistic missile division requested Air Research and Development Command headquarters to consider the merits of acquiring 80 acres of Standard Oil property adjacent to the Research and Development Center in El Segundo. Since this proposal was closely related to other problems and actions pressing for command decision and attention--proposed move of elements of the division to Norton Air Force Base, purchase of the R&D Center itself, and selection of this from among several prospective sites as a permanent home facility --a decision was deferred.

- 1960 Aug The Air Force Ballistic Missile Committee was briefed on long range facility requirements with emphasis on acquisition of the Standard Oil property. Briefing was centered around comparative cost of providing new facilities on this property versus use of Los Alamitos Naval Air Station. The committee deferred action on this plan and suggested Norton and March Air Force Bases be studied as possible sites.
- Aug The Navy-owned Torrance facility, consisting of three buildings (71, 72 and 73) was obtained by the Air Force on a five year permit to use from the Department of the Navy to provide space for additional Air Force and Army Corps of Engineers personnel. This influx of personnel was due to increased missile site activation responsibility assigned to the complex.
- Aug The B-4 hangar was acquired on License to Use from the Department of the Navy. This facility was acquired to support the missile division administrative flying and training operations.
- Oct Leased Buildings 70, 74, and 75.
- Dec Purchase by the Air Force of the Research and Development Center from Space Technology Laboratories. This site was the home of the new Aerospace Corporation.
- Dec Standard Oil sold El Segundo property to the Utah Construction and Mining Company.
- Dec Leased Building 76.
- Dec Douglas Aircraft Company offered to trade their Lawndale facility (Buildings 80 and 81) to the government as part payment for purchase of the Air Force Long Beach Plant No. 15.
- 1961 Jan The ballistic missile division requested approval for acquisition of the Douglas Lawndale property to provide facility potential and adequate land for long term needs.
- Feb Lease negotiated with Douglas for period of one year to use Lawndale property (Buildings 80 and 81).
- Mar Air Force headquarters submitted acquisition request for the Douglas Lawndale site to the House and Senate Armed Services Committees.
- Mar Leased Building 77 and 72 trailers.

- 1961 Apr Reorganization creating the Air Force Systems Command with Deputy Commander for Aerospace Systems located in Los Angeles over Ballistic Systems Division and Space Systems Division.
- Apr Leased Building 78 and 79.
- Apr Approval received for acquisition of Douglas Lawndale property.
- May Project for modification of Buildings 80 and 81 as Space Systems Division headquarters submitted to AFSC for approval.
- Jul Leased 18 additional trailers for use at Arbor Vitae facility.
- Oct General Services Administration obtained the Douglas Lawndale property and issued it to the Air Force on a permit to use, pending the official transfer to the Air Force.
- 1962 Jan Building 79 released.
- Feb Buildings 70 and 78 released.
- Feb Building 72 at Torrance facility returned to the Department of the Navy.
- Jun Permit to use four buildings at the Douglas El Segundo site issued by the Navy. This permit was issued as an interim measure pending transfer of the requested 50 acres of land and associated buildings to the Air Force.
- Jul Building 75 released.
- Jul Movement of the Ballistic Systems Division to Norton Air Force Base began.
- Jul The B-4 hangar transferred from the Navy to the Air Force.
- Sep Building 77 released.
- Sep Bids for modification of Buildings 80 and 81 opened.
- Sep 18 leased trailers from Arbor Vitae complex released.
- Sep Major portion of Ballistic Systems Division move to Norton Air Force Base completed.
- Oct General Services Administration permit to use Buildings 80 and 81 site extended to October 1963.

- 1962 Oct Proposed long range plans for ultimate location of Space Systems Division and Aerospace Corporation presented to Air Force Systems Command headquarters, Air Force headquarters, and the Office of the Secretary of the Air Force.
- Oct Douglas El Segundo site transferred from Navy to Air Force.
- Nov Proposed facility solution, including construction of new Aerospace Corporation buildings at El Segundo site, approved by the Secretary of the Air Force as "consistent with Air Force plans."
- Nov Aerospace Corporation acquired the El Segundo property and began building plans.
- Dec 53 of the 70 office trailers at the R&D Center released.
- Dec Building 76 released.
- Dec Buildings 80 and 81 (Lawndale site) permit to use cancelled and property returned to the General Services Administration.
- Dec Building Nine lease renewed for two years.
- 1963 Jan Balance of office trailers released.
- Feb Construction of Aerospace Corporation's El Segundo buildings began.
- Jun Buildings 71 and 73 returned to Navy.
- Oct Building Eight leased for two more years under a standard government lease negotiated by the Corps of Engineers. The building had previously been leased by Aerospace Corporation to house the printing plant function. That function would remain there for two more years until development of the El Segundo support site.
- Nov First occupancy of Aerospace Corporation's new El Segundo buildings.
- 1964 Feb Building Seven released.
- Apr Research and Development Center was redesignated Los Angeles Air Force Station and was transferred from an industrial facility to a command facility (AFSC).
- Apr Aerospace Corporation's El Segundo facilities completed.
- 1964 Apr Building Ten released.
- May Building One subleased.
- Jun Building Two subleased.

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## GLOSSARY OF ABBREVIATIONS

AFB	Air Force Base
AFBMD	Air Force Ballistic Missile Division
AFSC	Air Force Systems Command
AMC	Air Materiel Command
ARDC	Air Research and Development Command
Asst	Assistant
Bd	Board
BMC	Ballistic Missiles Center
BMD	Ballistic Missile Division (Air Force Ballistic Missile Division)
BMO	Ballistic Missiles Office
Brig	Brigadier
BSD	Ballistic Systems Division
Ch	Chief
Chmn	Chairman
Cmdr	Commander
CofS	Chief of Staff
Col	Colonel
Corp	Corporation
DCAS	Deputy Commander for Aerospace Systems, Air Force Systems Command
DCS	Deputy Chief of Staff
Dep	Deputy
Dir	Director
Div	Division
Gen	General
GMRD	Guided Missiles Research Division (of Ramo- Wooldridge Corporation)
Gp	Group
GSA	General Services Administration
Hq	Headquarters
Lt	Lieutenant
Ltr	Letter

Maj	Major
Matl	Materiel
Memo	Memorandum
Mgmt	Management
Msg	Message
Msl	Missile
Ofc	Office
Opns	Operations
Ord	Order
OSD	Office of the Secretary of Defense
Pres	President
Proc	Procurement
R&D	Research and Development
Rpt	Report
SAC/MIKE	Assistant Commander in Chief, Strategic Air Command
SAF	Secretary of the Air Force
SATAF	Site Activation Task Force
Sec	Secretary
SSD	Space Systems Division
STL	Space Technology Laboratories
Subj	Subject
Sys	Systems
USAF	United States Air Force
V/Cmdr	Vice Commander
Wg	Wing